

## WHAT IS CLAIMED IS:

1. A method to measure an application's performance in a network, comprising within a thread, monitoring a flow having one or more frames by calculating:  
  
an amount of time each of the frames is processed on a sending node in a network;  
  
an amount of time each of the frames is processed on a receiving node in the network; and  
  
an amount of time each of the frames is in transit across the network.
2. A method to analyze network performance resulting from a task, comprising:  
  
displaying a first time representing a time that one or more meaningful frames are in a network traveling in a first direction;  
  
displaying a second time representing a time that one or more meaningful frames are in the network traveling in a second direction;  
  
displaying a third set of times representing times that each of one or more nodes in the network is active.
3. The method of claim 2, wherein the first and second times, and the third set of times are displayed in a chart, and:

each of the first and second times is represented by a bar that shows at least one of:

a cumulative time that it took for the one or more meaningful frames to be inserted into the network;

the portion of time that the one or more meaningful frames were in the network as a result of queueing in routers, processing, and propagation (QPP).

the third set of times for a given node is represented by a bar that shows at least one of:

a total amount of time that the given node was processing during the task;  
and

a total amount of time that the given node was sending during the task, but not processing.

4. The method of claim 3, wherein the insertion time for each frame is computed as  $\text{AdjustedBytes} * 8 / \text{Bandwidth}$ , AdjustedBytes being used to indicate the bytes that would have occurred at the point the frame crossed a WAN (Wide Area Network) link in the network.
5. The method of claim 2, wherein the first and second times, and the third set of times are displayed in a detailed report.

6. The method of claim 5, wherein the detailed report comprises one or more of:
- an overall summary comprising the duration of the task;
  - a traffic section comprising byte and frame information;
  - a network busy time section comprising information about how busy the network was during the task, and how the busy time breaks down into insertion time and QPP time;
  - network frame transit statistics section comprising various transit times for each frame;
  - a node active time section comprising information about the processing and sending times for each node in the network; and
  - a node processing statistics section comprising statistics on the node processing periods.
7. A method to monitor network performance resulting from a task, comprising displaying a processing time corresponding to a first node in the network, each processing time having one or more attributes, including a processing type.
8. The method of claim 7, wherein the processing type comprises any one of: a time period prior to a first data frame in a thread sent by a client;
- a time period prior to a subsequent request within a thread is sent by the client;

a time period from a last data frame to the end of the task;

a time period prior to a first data frame in a thread sent by a server;

a time period from the point that the last frame within a thread in a request is received by the server to the time that a first response frame is returned by the server;

a time period that a first server processes after receiving a request from a lower tier until the first server begins sending a subsequent request to a second server;

a time period that a first server processes after receiving a reply from a second server until the second server begins sending its reply to a third server, the third server being a requesting node.

9. The method of claim 7, additionally comprising displaying one or more processing times, each processing time corresponding to a node in the network that is not the first node.
10. The method of claim 9, wherein each processing time additionally has at least one of the following attributes:

the number of errors associated with one of a start frame and an end frame;

a time span of the processing time;

a time at which the node corresponding to the processing time began processing;

a time at which the node corresponding to the processing time stopped  
processing;

a start frame representing a frame number at the beginning of the processing  
time;

a description of the start frame;

an end frame representing a frame number at the end of the processing time;  
and

a description of the end frame.

11. A method to analyze network performance, comprising generating a flows report to monitor a given flow, the given flow having one or more frames that are sent from a sending node to a receiving node, and the flows report having one or more attributes including:

an errors attribute depicting the number of errors belonging to the one or more  
frames;

a sending node attribute indicating the sending node;

a receiving node attribute indicating the receiving node;

a data duration attribute indicating a time period from when the sending node sent a first frame in the flow to the time that the receiving node received the last frame having data in the flow;

an average data rate attribute indicating an average data rate for the flow;

a bytes attribute indicating a total number of bytes in the frames in the flow;

a data payload bytes attribute indicating a sum of the payload bytes for the frames in the flow;

a frames attribute indicating a number of frames in the flow;

a data frames attribute indicating a number of frames having data in the flow;

a first frame attribute indicating a sequence number of the first frame in the flow;

a last data frame attribute indicating a sequence number of the last frame having data in the flow;

a last frame attribute indicating the sequence number of the last frame, having one of data and acknowledgement;

a start time attribute indicating a time that the first frame having data was sent;

an end data time attribute indicating a time that the last frame having data was received;

an end time attribute indicating a time that the last frame, having one of data and acknowledgement, was received;

a data direction attribute indicating a direction in which the flow was traveling;  
and

a network busy time attribute indicating a total time that the one or more frames was in transit during the flow.